Lloyd's Register

Rules and Regulations for the Classification of Inland Waterways Ships, November 2008

Notice No. 8

Effective Date of Latest Amendments:

See page 1

Issue date: April 2011

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RULES AND REGULATIONS FOR THE CLASSIFICATION OF INLAND WATERWAYS SHIPS,

November 2008

Notice No. 8

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Inland Waterways Ships, November 2008.* The amendments are effective on the dates shown:

Part	***Chapter***	***Section***	***Effective date***
5	4	3	1 July 2011
5	5	3	1 July 2011
5	6	Scope, 4	1 July 2011
5	10	2, 6, 7	1 July 2011
5	11	1, 4	1 July 2011
5	12	4, 8, 9	1 July 2011
5	13	1, 2, 3, 5, 6, 7, 8, 9	1 July 2011
5	15	1	1 July 2011
5	18	1	1 July 2011

The *Rules for Inland Waterways* are to be read in conjunction with this Notice No. 8.
The status of the Rules is now:

Rules for Inland Waterways	Effective date:	November 2008
Notice No. 1	Effective date:	1 March 2009 and Corrigenda
Notice No. 2	Effective date:	1 April 2009
Notice No. 3	Effective date:	1 July 2010 and Corrigendum
Notice No. 4	Effective date:	1 July 2010 and Corrigenda
Notice No. 5	Effective date:	1 March 2010 and Corrigenda
Notice No. 6	Effective date:	1 July 2010 and Corrigenda
Notice No. 7	Effective date	1 November 2010
Notice No. 8	Effective date	1 July 2011 and Corrigenda

Part 5, Chapter 4
Main Propulsion Shafting

Effective date 1 July 2011

■ *Section 3*
Design

3.8 Coupling Bolts

3.8.3 The minimum diameter of tap bolts or of bolts in clearance holes at the joining faces of coupling flanges, pretensioned to 70 per cent of the bolt material yield strength value, is not to be less than:

~~$$d_R = 1{,}267 \sqrt{\left[\frac{120\,10^6 F P (1 + C)}{R D} + Q\right] \frac{1}{n \sigma_y}}$$~~

$$d_R = 1{,}348 \sqrt{\left[\frac{120\,10^6 F P (1 + C)}{R D} + Q\right] \frac{1}{n \sigma_y}}$$

Part 5, Chapter 5
Propellers

Effective date 1 July 2011

■ *Section 3*
Design

3.2 Keyless propeller

(*Part only shown*)

3.2.1 The symbols used in 3.2.2 are defined as follows:

~~$$P_{10} = \frac{2M}{A_1 \theta_1 V_1} - 1 + \sqrt{1 + V_1 \frac{F_{10}^2}{M^2} + l}$$~~

$$P_{10} = \frac{2 M}{A_1 \theta_1 V_1} - 1 + \sqrt{1 + V_1 \frac{F_{10}^2}{M^2} + 1}$$

~~E_2 = modulus of elasticity of sleeve material, in N/mm^2.~~

ν_1 = Poisson's ratio for screwshaft material

ν_3 = Poisson's ratio for propeller material

Consistent sets of units are to be used in all formulae.

Part 5, Chapter 6
Shaft Vibration and Alignment

Effective date 1 July 2011

■ *Scope*

The requirements of this Chapter are applicable to the following systems:

(a) Main propulsion systems formed by oil engines or electric motors, directly driven or geared to the shafting,developing 500 kW and over, unless otherwise stated.

(b) Machinery driven at constant speed by oil engines, developing 500 kW and over, for essential auxiliary services including generator sets which are the source of power for main electric propulsion motors.

Unless otherwise advised, it is the responsibility of the Shipbuilder as main contractor to ensure, in co-operation with the Enginebuilders, that the information required by this Chapter is prepared and submitted.

■ *Section 4*
Lateral vibration

4.2 Particulars to be submitted

4.2.1 Calculations of the lateral vibration characteristics of shafting systems incorporating cardan shafts are to be submitted to LR for approval, irrespective of the power output.

Part 5, Chapter 10
Piping Design Requirements

Effective date 1 July 2011

■ *Section 2*
Carbon and low alloy steels

2.2 Wrought steel pipes and bends

~~*2.2.6* Pipes are not to pass through void spaces which are permanently sealed as mentioned in Ch 11,3.1.4.~~

2.2.6 Discharge pipes, except filling pipes of tanks, are not to pass though void spaces which are permanently sealed, as mentioned in Ch 11, 3.1.4. The filling pipes of tanks are to have a thickness of not less than 6,3 mm in accordance with Table 10.2.3, Note 2.

■ *Section 6*
Austenitic ~~S~~ stainless steel

6.1 General

6.1.2 The minimum thickness of stainless steel pipes is to be determined from the formula given in ~~2.2.4 or 2.2.5~~ 2.2.3 or 2.2.7 using a corrosion allowance of 0,8 mm. Values of the ~~0.2~~ 1,0 per cent proof stress and tensile strength of the material for use in the formula in 2.2.1 may be obtained from Table 6.5.2 in Chapter 6 of the Rules for Materials.

6.1.3 Where stainless steel is used in lubricating and hydraulic oil systems, ~~the~~ corrosion allowance ~~may be reduced to 0.3 mm~~ is not required.

■ *Section 7*
Valves

7.1 Design requirements

~~*7.1.14* Resiliently seated valves are not to be used in main or auxiliary machinery spaces as branch or direct bilge suction valves or as pump suction valves from the main bilge line (except where the valve is located in the immediate vicinity of the pump and in series with a metal seated non-return valve. The non-return valve is to be fitted on the bilge main side of the resiliently seated valve). When they are used in other locations and within auxiliary machinery spaces having little or no fire risk they should be of an approved fire safe type and used in conjunction with a metal seated non-return valve.~~

7.1.14 Resiliently seated valves are not to be used in main or auxiliary machinery spaces as branch or direct bilge suction valves or as pump suction valves from the main bilge line.

For exemptions of the above, resiliently seated valves may be accepted in positions indicated below, and subject to the following conditions:

(a) As pump suction valve from the main bilge line where the valve is located in the immediate vicinity of the pump and in series with a metal seated non-return valve. The non-return valve is to be fitted on the bilge main side of the resiliently seated valve.

(b) As branch suction valve where the branch is connected to a non-isolated bilge main, as per Ch 11,4.3, and in series with a metal seated non-return valve. The non-return valve is to be fitted at the branch side of the resiliently seated valve.

(c) When they are used in other locations and within auxiliary machinery spaces having little or no fire risk, they should be of an approved fire safe type and used in conjunction with a metal seated non-return valve.

Part 5, Chapter 11
Ship Piping Systems

Effective date 1 July 2011

■ *Section 1*
General requirements

1.1 Application

1.1.4 The Rules for bilge systems for dry cargo vessels carrying dangerous goods have been derived from requirements of the ~~ADNR Regulations of the Central Rhine Commission and the~~ European provisions concerning the international Carriage of Dangerous Goods by Inland Waterways ADN which assume heavy traffic on relatively narrow waterways through heavily populated areas. ADN is an abbreviation from Accord européen relative au transport international des merchandises Dangereuses par voie de Navigation intérieure. ~~The letter "R " for ADNR is standing for Rhin.~~ *See also* Pt 4, Ch 1,12.

■ *Section 4*
Bilge drainage of machinery space

4.3 Branch bilge suction arrangements connected to non-isolated bilge main

4.3.1 For ships other than passenger ships where the bilge main is not separated as per 7.2.1, the branch bilge suctions referred to in 4.1.1 and 4.1.3 may be connected to the common suction pipe between the two bilge pumps, provided one automatic non-return valve is fitted in each branch bilge suction in addition to the ~~and one additional~~ screw-down non-return valve required by 7.1.1 ~~will be fitted in each branch bilge suction.~~.

Part 5, Chapter 12
Machinery Piping Systems

Effective date 1 July 2011

■ *Section 4*
Oil fuel pumps, pipes, fittings, tanks, etc.

4.4 Pipes conveying oil

4.4.5 Fuel oil tanks in the machinery space situated at Port side and Starboard side may be connected with a crossover. Where fitted, the arrangements are to comply with the requirements of 4.4.6 to 4.4.9.

4.4.6 The crossover is provided with valves of an approved type and ductile material, fitted in a visible and accessible position and secured to the relevant tanks.

4.4.7 The crossover pipe must have a diameter of not less than 3" (88,9 mm) and a wall thickness of not less than 8,8 mm and is to be suitably protected against mechanical damage. The pipe is to be manufactured from seamless steel or other approved material having welded joints of the full penetration type.

4.4.8 Connections on the crossover intended for fuel oil supply to the engines or any boiler may be fitted provided a quick closing valve as per 4.6.2 is installed at each connection.

4.4.9 Alternatively, when the valves for the crossover fitted to the tanks are quick closing valves, the following conditions are to be complied with;

- The wall thickness of the crossover pipe is to be not less than indicated in Ch 10, Table 10.2.3, last column.
- The crossover pipe is to be in compliance with 4.4.2.
- The individual connections to the engines and boilers are not required to comply with 4.4.8.
- Operating the quick closing valves of the crossover should not lead to shut-off of the fuel supply to main and auxiliary engines causing a dead ship situation.

■ *Section 8*
Lubricating oil systems

8.1 General

8.1.1 In addition to the requirements detailed in this Section, the requirements of Sections 2 and 4 are to becomplied with in so far as they are applicable. In all cases, the following are to apply:

- 2.6.1 to 2.6.3, Precautions against fire.
- 4.1, Control of pumps.
- 4.2, Relief valves on pumps.
- 4.4, Pipes conveying oil.
- 4.10, Separate oil fuel tanks.
- 4.6.1, Valve or cock secured to the tank.

■ *Section 9*
Hydraulic systems

9.1 General

9.1.1 The arrangements for storage, distribution and utilisation of hydraulic and other flammable oils employed under pressure in power transmission systems, control and actuating systems in locations where means of ignition are present, are to comply with the provisions of:

- 2.6.1 to 2.6.3, Precautions against fire.
- 4.1, Control of pumps.
- 4.2, Relief valves on pumps.
- 4.4, Pipes conveying oil.
- 4.10, Separate oil fuel tanks.
- 4.6.1, Valve or cock secured to the tank.

Part 5, Chapter 13
Piping Systems for Ships Intended for the Carriage of Liquids in Bulk

Effective date 1 July 2011

■ *Section 1*
General requirements

1.1 Application

1.1.5 The requirements of this Chapter basically take into account the ~~ADNR Regulations of the Central Rhine Commission and the~~ European provisions concerning the International Carriage of Dangerous Goods by Inland Waterways ADN which assume heavy traffic on relatively narrow waterways through heavily populated areas. ADN is an abbreviation from Accord européen relative au transport international des merchandises Dangereuses par voie de Navigation intérieure. ~~The letter 'R' for ADNR is standing for Rhine.~~ *See also* Pt 4, Ch 4,1.2.

1.1.6 Although the contents of this Chapter take the ~~ADNR and~~ ADN Regulations into account, the issue of an ~~ADNR/~~ADN Certificate on behalf of the Relevant Authorities requires full compliance with their Regulations.

1.1.7 In addition to the requirements of this Chapter, attention is to be given to any National and International technical and operational requirements of countries where the ship is registered or operating, and which are outside the area of ~~ADNR/~~ADN legislation or classification as defined in these Rules.

1.3 Materials

1.3.8 For a list of dangerous goods, see the ~~ADNR/~~ADN, Table C, Part 3. Subject list of chemicals could be downloaded from: http://www.ccr-zkr.org. *See also* Pt 4, Ch 6,1.3.

1.3.9 All additional requirements for the particular substance as contained in Table C of Part 3 of the ~~ADNR/~~ADN are to be complied with by the particular tanker before a substance is allowed to be carried. This also includes any additional requirements contained in column 20 of Table C.

1.5 Cargo zone

1.5.2 Internal combustion engines, or any other equipment which could constitute a possible source of ignition, are not to be situated within the cargo zone, except in the case of Type N-open tankers not built in compliance with ~~ADNR/~~ADN requirements.

1.6 Cargo pump-room

1.6.2 For ships required to comply with the ~~ADNR/~~ADN Regulations, the cargo pump room is to be separated from the engine room or service space outside the cargo zone by a cofferdam, hold space containing cargo tanks or service space. Alternatively, the bulkhead between the machinery space/pump room or service space outside the cargo zone/pump room is to be provided with a fire insulation A-60 in accordance with SOLAS II-2, Reg. 3. This requirement is not applicable for Type N-open tankers. Shaft penetrations for pumps as per 2.2.12 and 3.2.5 are not acceptable for bulkheads having an A-60 insulation.

1.9 Bulkhead penetrations

1.9.2 For ships required to comply with the ~~ADNR/~~ADN Regulations penetrations through a bulkhead with an 'A-60' fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, shall have an equivalent fire protection. *See also* 1.6.2.

■ *Section 2*
Piping systems for bilge, ballast, oil fuel, etc.

2.2 Drainage and/or ballasting of spaces within the cargo zone

2.2.5 For ships required to comply with the ~~ADNR/~~ADN Regulations and provided with an A-60 bulkhead insulation as per 1.6.2, filling of the cofferdam may be waived.

■ *Section 3*
Cargo handling system

3.10 Slop tanks and vessels intended for slops for Type C tankers and Type N tankers

3.10.4 Slop tanks For Type N closed tankers and Type C tankers are to be provided with:

- A high velocity valve in compliance with 5.1.2 as far as applicable.
- A vacuum valve in compliance with 5.1.2 as far as applicable.
- A vacuum valve in compliance with 5.2.3 (e) when explosion protection is required as per the ~~A.D.N.R~~. ADN Table C, Column 17.
- A high velocity vent valve in compliance with 5.2.3 (c) when explosion protection is required as per the ~~A.D.N.R~~. ADN Table C, Column 17.
- A sounding device of approved type.
- Connections with valves intended for pipes and hoses.

■ *Section 5*
Cargo tank venting arrangements

5.1 General

5.1.2 Cargo tank venting arrangements are to be designed to provide:

(a) pressure/vacuum release of small volumes of vapour/air mixtures flowing during a normal voyage;

(b) venting of large volumes of vapour/air mixtures during cargo handling and gas freeing operations; ~~and~~

(c) ~~a secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent overpressure or under pressure in the event of failure of the arrangements in 5.1.2(b). Alternatively, pressure~~ Pressure sensors ~~may~~ are to be fitted to monitor the overpressure and under pressure of ~~in~~ the gas phase in each cargo tank protected by the arrangement required in 5.1.2(b), with a monitoring system in the ship's ~~cargo control room~~ wheelhouse or the position from which cargo operations are normally carried out. Such monitoring equipment is also to provide an alarm facility which is activated by detection of overpressure or under pressure conditions within a tank. The alarm facility shall give a visible and audible alarm at the wheelhouse. If the wheelhouse is not supervised an additional alarm is to be provided at the position from which cargo operations are normally controlled.

5.2 Pressure/vacuum and venting systems for various tanker types

(*Part only shown*)

5.2.3 Type C and N-Closed. Each cargo tank or group of cargo tanks connected to a common vapour pipe is to be provided with:

(a) means to prevent the tanks being subjected to an over pressure exceeding 115 per cent of the set pressure of the high velocity valve or to ~~an~~ a design under pressure of the tanks. ~~exceeding 110 per cent of the set pressure of the vacuum valve with a maximum of~~ In any case, the under pressure is not to exceed 5 kPa during the voyage and any phase of the cargo handling.

(k) If explosion protection is not required as per the ~~A.D.N.R~~ ADN, Table C, Column 17 the following relaxations can be given:

5.6 Pressure and temperature control of the cargo for a Type G tanker

5.6.3 For certain highly dangerous cargoes specified in Table C of the ~~ADNR/~~ADN, the cargo containment system should be capable of withstanding the full vapour pressure of the cargo under conditions of the upper ambient design temperatures irrespective of any system provided for dealing with boil-off gas, (*see* 1.3.8 for Table reference).

■ *Section 6*
Cargo tank level gauging equipment and arrangements against overfilling

6.3 Precautions against overfilling

6.3.5 For the maximum allowable cargo related filling limits see ~~ADNR/~~ADN Table C, Column 11, *see* 1.3.8.

6.3.6 Pressure vessels for Type G tankers may not be filled to more than 91 per cent for uncooled and 95 per cent for cooled cargoes. *See also* ~~ADNR/~~ADN, Part 3, Table C, column 11, *see* 1.3.8.

6.4 Cargo sampling arrangements

6.4.3 On cargo tanks of Type C and N ships these devices are to be of the closed or restricted type. Conform to the requirements of ~~ADNR/~~ADN, Table C, Column 13, *see* 1.3.8 ~~for reference~~. The sampling opening is to be in compliance with 6.4.8.

■ *Section 7*
Cargo heating arrangements

7.3 Heating medium

7.3.1 The heating medium is to be compatible with the cargoes to be heated. Where a cargo is highly water reactive,water or steam is not to be used as the medium. For lists of chemicals containing information on water reactivity, *see* ~~ADNR/~~ADN, Table C, *see also* 1.3.8.

■ *Section 8*
Cargo temperature control arrangements

8.1 Temperature measurement

8.1.2 For the maximum allowable temperature, see ~~ADNR/~~ADN, Table C, Column 20, *see* 1.3.8 ~~for reference~~.

8.2 Water spray system

8.2.5 For cargoes for which a water spray system is mandatory, see list of chemicals in ~~ADNR/~~ADN, Table C, Column 9, *see* 1.3.8.

Part 5, Chapter 13 and Part 5, Chapter 15

■ *Section 9*

Inert gas systems

9.2 Type C tankers and Type ~~N-open~~ N-Closed tankers

9.2.7 The inert gas discharge may be connected with the vapour return system for ships carrying cargoes for which inert gas is not mandatory as per the ~~ADNR~~ ADN, Table C, Column 20, additional requirements. Two means of isolation as per 9.2.8 or 9.2.9 are to be provided in the connection to the vapour return line. In addition a removable spool piece is to be provided on the cargo tank side of the connection. A notice is to be provided located in a prominent position adjacent to the means of isolation, clearly indicating that the spool piece is to be removed and blanking flanges are to be fitted, when the inert gas system is not in use. The removable spool piece is to be clearly identified (labelled/painted in a distinctive colour) and stowed close to its working position.

9.3 Type G tankers

9.3.6 The equipment should be capable of producing inert gas with an oxygen content at no time greater than 5 per cent by volume. A continuous-reading oxygen content meter should be fitted to the inert gas supply from the equipment and should be fitted with an alarm set at a maximum of 5 per cent oxygen content by volume. The above is subject to the special requirements of Table C of Part 3 of the ~~ADNR/~~ ADN where a lower maximum oxygen content may be specified for specific cargoes.

Part 5, Chapter 15

Steering Gear

Effective date 1 July 2011

■ *Section 1*

General

1.6 Rudder, rudder stock, tiller and quadrant

(*Part only shown*)

Table 15.1.1 Connection of tiller to stock (*conclusion*)

Symbols		
b_s	=	distance between the section of the tiller arm under consideration and the centre of the rudder stock, in mm NOTE: b_T and b_s are to be measured with zero rudder angle
b_T	=	distance from the point of application of the load on the tiller to the centre of the rudder stock, in mm
n_{tb}	=	number of bolts in the connection flanges, but generally not to be taken greater than six
t_s	=	thickness of shim for machining bolted tillers and quadrants, in mm
Z_{TA}	=	section modulus of tiller arm, in cm^3
δ_{su}	=	rule rudderstock diameter in way of tiller, *see* Table 12.2.1 in Pt 3, Ch 12 ~~For high tensile steel, a material factor ko may be applied as follows:~~ The rudderstock diameter obtained from Table 12.2.1in Pt 3, Ch 12 is based on the specified material properties of the rudder stock. An equivalent rudder stock diameter δ_e may be applied for components having a different material from the rudder stock material. This equivalent diameter may be determined as follows:- ~~$k_0 = \sqrt[4]{\left(\frac{235}{\sigma_o}\right)^3}$~~ $\delta_e = \delta_{su}\left(\frac{\sigma_o}{\sigma_{oc}}\right)^{0,25}$ where σ_o = the ~~Y~~yield stress of the rudder stock material ~~limited to 70 per cent of the UTS or 450 N/mm^2 whichever is the lesser~~ σ_{oc} = the yield stress of the component material Both stresses are to be taken not greater than 70 per cent of the ultimate tensile strength or 450 N/mm^2, whichever is lesser. As minimum, the stresses are to be not less than 200 N/mm^2
a		
d_{tb}	=	diameter of bolts securing bolted tillers and quadrants, in mm

Part 5, Chapter 18
Elevating Wheelhouse Systems

Effective date 1 July 2011

■ *Section 1*
General requirements

1.3 Materials

1.3.3 Where it is proposed to use materials other than those specified in the Rules for Materials, details of the chemical compositions, heat treatment and mechanical properties are to be submitted for approval. In such cases, the values of the mechanical properties used for deriving the allowable stress are to be subject to agreement by LR.

Existing paragraphs 1.3.3 *to* 1.3.5 *have been re-numbered as* 1.3.4 *to* 1.3.6.

Cross-references

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Inland Waterways.

Part 5, Chapter 2

4.4.3 *Reference* 8.4 *now reads* 2.10.4

Part 5, Chapter 12

4.9.2 *Reference* 16 *now reads* 1.6

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